

In the Claims:

The following listing of the claims replaces all previous claim listings.

1. (Original) A focused particle beam metrology device comprising:  
a focused particle beam source which produces low intensity focused particle beam directed to a semiconductor device having features thereon;  
a detector which detects electrons or ions emitted from said semiconductor device;  
a processor which receives data from said detector and measures dimensions of said features from said data;  
a discharge device which introduces an organic chloride toward said semiconductor device; and  
a control device connected to said particle beam device to vary intensity of said focused particle beams for generating a high intensity focused particle beam to etch said semiconductor device.
2. (Original) The metrology device of claim 1, wherein said detector is located substantially above said semiconductor device for top-down linewidth measurements.
3. (Original) The metrology device of claim 1, further comprising a display device connected to said processor, wherein said display device displays an image of said semiconductor device.
4. (Original) The metrology device of claim 1, wherein high intensity focused particle beam completely etches through said semiconductor device.
5. (Original) The metrology device of claim 1, wherein the semiconductor device includes a copper layer.

6. (Original) The metrology device of claim 1, wherein said high intensity particle beams etch a crater in said semiconductor device exposing a cross-section of said semiconductor device, and said low intensity particle beams scan said cross-section at a predetermined angle to form an image of said cross-section.

7. (Original) The metrology device of claim 1, further comprising a movable platform for holding said semiconductor device, wherein said movable platform is tilted at said predetermined angle during said low intensity particle beam scanning of said cross-section.

8. (Original) A microelectronic device comprising a copper layer on a substrate, said copper layer having an opening formed therein, said opening having a side wall and said opening exposing a surface portion of said substrate, said surface portion having surface topography less than 30% relative to the thickness of the copper material removed, and said side wall having a slope not greater than 10 degrees from vertical.

9. (Original) A microelectronic device according to claim 8, said surface portion having surface topography less than 20% relative to the thickness of the copper material removed, and said side wall having a slope not greater than 5 degrees from vertical.

10. (Original) The device of claim 8, wherein said opening is a well.

11. (Original) The device of claim 8, wherein said substrate comprises a dielectric.

12. (Original) The device of claim 8, wherein said substrate comprises a semiconductor.

13. (New) The device of claim 1, wherein the discharge device comprises an organic chloride reservoir that contains an organic chloride.